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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/016,939 | 12/14/2001 | Glen E. Roeters | DENSE-052A | 3868 |

36485 7590 03/09/2005

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| EXAMINER |
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ZARNEKE, DAVID A

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| ART UNIT | PAPER NUMBER |
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2829

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

14A

Office Action Summary

Application No.

10/016,939

Applicant(s)

ROETERS ET AL.

Examiner

David A. Zarneke

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 10-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/3/02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claims

In the response dated 12/20/04, applicant states and shows on the listing of the claims that claims 22-25 are withdrawn.

The examiner points out that in the response dated 7/28/04, claims 22-25 were canceled without prejudice.

Please note and correct this in the next response.

Election/Restrictions

Applicant's election with traverse of Figure 1, claims 1-9, in the reply filed on 12/20/04 is acknowledged. The traversal is on the ground(s) that there is no serious burden placed upon the examiner to examine both groups. This is not found persuasive because a serious burden does exist because two separate inventions are claimed, which requires searching multiple ideas and concepts simultaneously. This places a serious burden upon the examiner.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe et al., US Patent 4,982,265.

Watanabe (figures 1 & 2) teaches a chip stack comprising:

a flex circuit comprising;

a flex substrate [1];

a first conductive pattern (5, 66+) disposed on the flex substrate; and a plurality of leads [2] extending from the flex substrate and electrically connected to the first conductive pattern (5, 66+);

at least two integrated circuit chip packages [4A-D] electrically connected to the first conductive pattern.

Watanabe teaches that the flex substrate is made of a ceramic (5, 38+), which is flexible to at least some degree. The specification does not define what flexible means. There is no quantification for the term flexible, therefore a ceramic material meets the limitation of the claims because all things are flexible, at least to some degree.

Regarding claim 2, Watanabe teaches the flex substrate defines opposed top and bottom surfaces; and

the first conductive pattern comprises:

a first set of flex pads disposed on the top surface of the flex substrate (5, 66+); and

a second set of flex pads disposed on the bottom surface of the flex substrate (6, 15+);

the flex pads of the first and second sets being electrically connected to the leads (5, 66+ & 6, 15+), with one of the integrated circuit chip packages being disposed upon the top surface of the flex substrate and electrically connected to at least some of the flex pads of the first set and one of the integrated circuit chips being disposed upon the bottom surface of the flex substrate and electrically connected to at least some of the flex pads of the second set (figure 2).

With respect to claim 3, Watanabe teaches the flex pads of the first and second sets are arranged in identical patterns (figure 2).

As to claim 4, Watanabe teaches the flex substrate has a generally rectangular configuration defining opposed pairs of longitudinal and lateral peripheral edge segments; and the leads extend from at least one of the longitudinal and lateral peripheral edge segments of the flex substrate (figures 1 and 2).

Regarding claim 6, Watanabe teaches the integrated circuit chip packages each comprise:

- a package body [4A-D] having opposed, generally planar top and bottom surfaces; and

- a plurality of conductive contacts disposed on the bottom surface of the package body (5, 49+);

the conductive contacts of one of the integrated circuit chip packages being electrically connected to respective ones of the flex pads of the first set, with the conductive contacts of one of the integrated circuit chip packages being electrically connected to respective ones of the flex pads of the second set (figure 2).

With respect to claim 7, Watanabe teaches the flex pads of the first and second sets and the conductive contacts are arranged in identical patterns (figure 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al., US Patent 4,982,265, as applied to claim 1 above.

In re claim 5, though Watanabe fails to teach each of the leads is an S-lead, barring a showing of unexpected results, it would have been obvious to one of ordinary skill in the art to use S-leads in place of the leads of Watanabe because the lead type is interchangeable and S-leads would allow attached to another substrate without having to form openings in the other substrate.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

As to claim 8, though Watanabe fails to teach each of the integrated circuit chip packages comprises a CSP device, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a CSP device as the chip of Watanabe because CSP devices are commonly used in the art chips. The use of conventional materials to perform there known functions in a conventional process is obvious (MPEP 2144.07).

In re claim 9, though Watanabe fails to teach the integrated circuit chip packages are each selected from the group consisting of: a BGA device; a fine pitch BGA device; and a flip chip device, barring a showing of unexpected results it would have been obvious to one of ordinary skill in the art at the time of the invention to use a BGA

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device; a fine pitch BGA device; or a flip chip device as the chip of Watanabe because these are commonly used equivalents chip packages used in the art.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

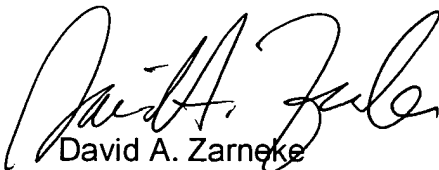
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Zarneke whose telephone number is (571)-272-1937. The examiner can normally be reached on M-F 7:30 AM-6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Baumeister can be reached on (571)-272-1712. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'David A. Zarneke', is written over the printed name.

David A. Zarneke
Primary Examiner
March 5, 2005